

AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.



AGRICULTURAL NEWS LETTER

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The AGRICULTURAL NEWS LETTER serves as a medium of reporting new developments and new ideas in the field of agriculture, particularly as they are related to advancements through research. Material appearing herein may be reprinted in whole or in part, in the interest of advancing the general knowledge of new agricultural practices.

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WHAT FARM EDITORS ARE SAYING:

"Customers, not the government, make jobs. They make jobs by buying the product or the service. They do not buy automatically. They must be sold. So long as they are sold, the rest of the folks have jobs. When the customer stops being sold there is trouble." -- Dick Meister in AMERICAN FRUIT GROWER

"Science and technology and modern packaging and transportation methods have made orange juice a part of the food intake of millions. The contribution to better nutrition is obvious." -- Walter J. Murphy in JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

"In terms of work-hours, food is cheap." -- Arthur Jenkins in FARM JOURNAL

"The older farmer who is up to his ears in farm work and farm business, as well as the young fellow who is just starting out, will have to keep hunting for better ways of doing things, better yields, higher quality. It will be quite a job keeping up in the race, but it will also be an exciting experience." -- Paul Johnson in PRAIRIE FARMER

"If a few million more women -- or men -- would drink an extra glass a week, we could wash out that dairy surplus in a hurry. We don't have too many cows or too much milk. We just have a set of bad food habits." -- WALLACES' FARMER AND IOWA HOMESTEAD

"Almost 60 years ago an observer of the farm field wrote his comments to the effect that 'invention can make little or no further advance in any line of agricultural machinery owing to the perfection already realized. The climax seems to have been reached.' Today we seldom or never indulge in such satisfied remarks about the status quo because the past 20 years have unfolded marvels and improvements that defy the highest reaches of the human imagination." -- Cap Mast in AGRICULTURAL LEADERS' DIGEST

"If you didn't have the privilege of participating in the government you would be holding secret meetings to get that privilege back." -- E. R. Eastman in AMERICAN AGRICULTURIST

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NEW CHEMICAL, DPPD, STOPS
RANCIDITY IN POULTRY FEED

A new chemical which keeps the fat content in poultry feeds from turning rancid, an important step in the control of "crazy chick" disease (chick encephalomalacia), is now being offered by the Du Pont Company.

The feed additive, known as DPPD feed grade anti-oxidant, retards the oxidation which produces rancidity. More serious than the off-odor and off-flavor which characterize rancid feed is the accompanying nutritional change due to destruction of the fat-soluble vitamins, particularly Vitamin E.

Research at the University of Connecticut has shown the importance of feed antioxidants in preventing "crazy chick" disease. There are also indications that DPPD increases the efficiency of carotenoid utilization.

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MOVIES FOR YOUR MEETINGS

Two new films on modern agricultural practices have just been released by the Du Pont Company and will be available for showings at farm meetings, or for agricultural class use.

Of general interest throughout the country, wherever livestock are raised, is a documentary film on the control of internal parasites. The picture features the new method of feeding phenothiazine in the daily ration to inhibit worm reproduction and prevent parasite build-ups in herds and grazing areas.

Of more specialized interest where non-irrigated cotton is grown is a film on weed control, based on both tests and practical grower use of the new substituted urea material, "Karmex" DL herbicide, in certain sections of the cotton belt. Methods of application, and the way in which a sprayer may be calibrated to deliver just the right amount of material are carefully explained.

Both films are available for 16 mm. sound projectors. Requests for their use should be made well in advance of the date showings are desired.

CAVALCADE TO FEATURE
STORY OF BOY ON FARM

The appealing story of a city orphan boy's adjustment to new foster parents, and simultaneously to life on their farm, is the theme of "How to Raise a Boy," the TV drama to be featured on the Du Pont Company's "Cavalcade of America" program over the ABC network on April 12.

The story shows how farm life, the care of livestock and crops, and modern farm home living can change the attitude and outlook of the boy. Elements in this period of readjustment are activities in both 4-H Club and Future Farmers of America rural youth organizations.

The program will appear over 78 TV stations covering every state, reaching an estimated audience of more than 14,000,000 viewers. While many of these stations will carry it as part of their ABC network coverage on Tuesday, April 12, others will show the film on local program times later that week. Prints of the film in 16-mm size will be available for later showings at farm meetings and before rural youth groups.

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BUT NOT FOR CLUB ROOT!

"Manzate" fungicide has been proven of value in protecting a variety of crops from many of the plant diseases that beset them, but it should not be recommended for the control of cabbage club root, as reported in the last issue of this news letter.

Due to a reporting error, it was stated that "Manzate" had produced good results in tests against the club root organism conducted at the Waltham Field Station, Mass. To correct us, Dr. E. F. Guba has sent us the data from his 1954 tests. "Manzate" did not look promising in these tests. Best control was obtained with mercury compounds, with the top control resulting from the use of mercuric bichloride at one part to 1500, applying a half-pint of the solution per hill. We regret our misstatement!



This "boy and calf" scene is from the "Cavalcade of America" TV drama, "How to Raise a Boy," to be shown throughout the country the week of April 12.

PERFORATED POLYETHYLENE TUBING

TESTED IN DRAINING IOWA FIELDS

The successful use of perforated tubes of polyethylene to drain excess water from farm fields was reported recently by Dr. Glenn O. Schwab, agricultural engineer at Iowa State College, in a paper presented to a meeting of the American Society of Agricultural Engineers.

Dr. Schwab said he believes the polyethylene tubes hold some promise as lower cost drainage systems for certain field situations. Testing so far, he emphasized, has been to evaluate the practicality of polyethylene tubes for drainage.

Dr. Schwab and other agricultural engineers at the college installed the tubes on the Howard County Experimental Farm at the experimental farm at Ankeny. They believe the tubes may be used to drain hillside seeps, grassed waterways, and tight soils where tile drains would have to be less than 100 feet apart to drain the soil satisfactorily.

Polyethylene tubes of three dimensions -- two-inch, inch and a half, and one-inch diameters -- have been installed in the college tests. These tubes were perforated with 12 quarter-inch holes per foot to take in water from the surrounding soil. Installation was made at varying depths -- some as deep as three feet -- with a "mole" machine that makes a hole larger than the tube. The machine draws the tubing into mole channel as it is formed below the surface.

Tests showed the polyethylene tubes, with their smaller diameters, to be slower than five-inch tile in removing water; however, they did effectively drain off excess water.

Dr. Schwab pointed out that the study of this method of draining disclosed several limitations. There was a definite limit to the length that could be installed. On flatter slopes maximum for two-inch tubing seemed to be 500 feet, for inch and a half tubing, 250 feet and for one-inch, 100 feet. On steeper slopes the systems could be longer. Rodents have been found to damage some underground plastic tubing. Tubing is not now generally available with the perforations.

The polyethylene tubing offers the advantage of lower cost. According to Dr. Schwab's estimates a drainage system with two-inch tubing would cost about three-fourths as much as a system of five-inch tile. The costs would be lower for smaller tubing -- about half as much as tile for inch and a half tubes and one-third as much for one-inch.

The work on polyethylene tubes for drains came after unsuccessful trials to get adequate drainage by merely boring an underground drain in the soil. These holes soon crumbled in.

However, with the tube inside the hole, the system may have relatively long life.

Besides performance of the tubes as drains, Dr. Schwab studied the physical properties of the polyethylene tubes. He found that the ability of the polyethylene tubes to hold their shape decreased as the wall thickness of the tube was decreased and the diameter of the tube increased.

His study set minimum wall thicknesses for tubes of different sizes that could be expected to hold up under field conditions. He reports that wall thickness of one twenty-fifth of an inch was the minimum for inch and a half diameter tubing; one twentieth of an inch for two-inch tubing; one twelfth of an inch for three-inch tubing; and an eighth of an inch for four-inch tubing. These wall thicknesses, he reports, should prevent tube deformation of greater than 20 per cent of the original diameter.

Most of the tube deformation, according to Dr. Schwab, occurred during the first two years after installation. The size of the mole channel, he added, had little or no effect on the deformation of the tubes in channels a half-inch to two inches larger than the diameter of the tubes. Work by other research men, he said, has shown that the polyethylene tubes may be expected to last for 20 years in the underground mole channels.

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NEW INSECTICIDE-FUNGICIDE

SEED PROTECTANT ANNOUNCED

An effective combination of dieldrin insecticide and "Arasan" seed disinfectant has been developed by the Du Pont Company for the treatment of beans (including limas), seed corn (field and sweet), and pea seed.

The new material is being marketed under the trademark "Delsan" AD seed protectant. It combines protection by "Arasan" against such soil-born organisms as seed decay and seedling blight with control of soil insects such as seed-corn maggot, provided by the dieldrin. However, where heavy infestations of such soil insects as wire worms exist, the material should be fortified, like any other insecticide seed treatment, by broadcasting a suitable insecticide over the soil before planting treated seed.

Field tests with this combination show that its use will usually increase both stands and yields. Trials have been conducted on corn and beans in Wisconsin, New York, and Pennsylvania; on beans and peas in Michigan; on corn in Minnesota and Iowa, and on beans in Virginia.

FOOD PROCESSING RESEARCH

TEMPTS AMERICAN APPETITE

The word "research" is certainly no stranger in pages of "Agricultural News Letter" since a large percentage of each issue is devoted to developments stemming from research and aimed at helping the farmer produce bigger, better and more economical crops.

Another field of research deserving important consideration is the continuing work of food chemists and processors that brings an amazing flow of new products to grocery shelves. This is an area in which research is providing new and in many cases more profitable markets for crops and livestock, and at the same time offering the American family an opportunity to enjoy more nutritious meals with less work for the housewife.

Recent figures compiled by the Grocery Manufacturers of America, Inc., show that we spend 25 per cent of our after-tax income for food. But if we were buying only the types and amounts of food per person we consumed in the pre-war period our food expenditures would take only 17 per cent of our income. The introduction of many new food products has meant that we now eat better than we did a few years ago, and that the convenience of new food packages and processes has cut the homemaker's meal preparation time by about four hours a day.

While new food production tools and methods have enabled the farmer to produce more and better raw foods since the end of World War II, the biggest factor in the food picture seems to have been the skyrocketing of production and sale of processed convenience-foods. Here are some examples, showing the percentage of gains in pounds per person of various types of processed food consumed, compared with the pre-war period of 1935-39:

Baby foods	1500%	Canned vegetable juices	115%
Frozen vegetables	1275%	Non-fat dry milk	110%
Frozen fruits & juices	850%	Ice cream	80%
Canned fruit juices	275%	Canned vegetables	40%
Canned meat	200%	Canned fruit	40%
Canned soup	125%	Cheese	35%

While making these foods more convenient through new processing and packaging techniques, food companies point out that they have not increased their prices to the housewife.

When the nation's future food needs are estimated, this factor of a population which is eating better than ever before must be considered along with the "fifth plate" resulting from population increases.

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Night treatment of a poultry flock to control chronic respiratory disease, using a new aerosol product which dispenses a mist containing the antibiotic, streptomycin. Use of a mask, as shown, or some other device to prevent inhalation of the spray by the poultryman is advised. (Photo courtesy of Dr. Salsbury's Laboratories)

ANTIBIOTICS IN AEROSOL TREAT

POULTRY RESPIRATORY TROUBLES

One of the newest wrinkles in aerosol products for agriculture is a handy little push-button can with which the poultryman can treat his flock for chronic respiratory disease by spraying a fine mist of a product containing streptomycin.

One of the first products of this type on the market is an aerosol unit containing sufficient spray to treat 100 birds during a 30-second discharge. The mist from the can is sprayed into the poultry house above the chickens, then settles slowly to the level where it is inhaled by the birds. As in most aerosol containers, "Freon" fluorinated hydrocarbons which are non-flammable and create no toxic problem are used as propellants to force the spray out through the nozzle at the touch of the valve button.

Poultry research during recent years has shown that several antibiotics, including streptomycin, will stimulate the appetite and help control infections of chronic respiratory disease, one of the country's major poultry problems, particularly in cold, damp weather.

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Stressing the need for conserving our national supply of protein feeds, True D. Morse, Under Secretary of Agriculture, pointed out in a recent speech that: "The increased use of urea in feeds for cattle and sheep is a development that can save protein."

CHEMICAL CONTROL OF WEEDS IN IRRIGATION DITCHES DESCRIBED

Weeds in ditches are a major problem in California's Imperial Valley, where growers depend on a network of irrigation channels bringing water from the All-American canal to insure their fabulous production of fruits, vegetables, and forage crops.

A recent bulletin distributed by the Farm Advisor's office in Imperial County, outlines an economical method of keeping these ditches free of weeds through the use of "Karmex" W herbicide, one of the modern substituted urea weed killers.

"Controlling weeds by hand or burning is an expensive operation and the control obtained is only temporary," the folder points out. "For labor and materials the estimated cost is approximately \$200 for maintenance of a half-mile of ditch for one year. Using a chemical for weed control would cost approximately \$120 a year."

Stressing the economic loss to growers caused by weed-filled ditches, the bulletin details that "weeds slow down water delivery, decrease ditch capacity, clog portholes, and cause drainage ditches to fail. Weeds increase water loss from seepage and evaporation. Seeds from weeds are carried in the water out into the fields where they create an additional problem and expense."

"Excellent results" in the control of most weeds is credited to the use of "Karmex" W herbicide. In the case of Bermuda grass, a particular pest in that part of California, one spraying with this material is said to give control for six months or longer and "a second application after five or six months, using half of the original rate, should extend the control of most weeds for a year to a year and a half." Nutgrass is mentioned as the one weed which this chemical does not seem to control too well, but even here the material is said to retard the growth for a month or two, after which time the nutgrass slowly comes back.

Under Imperial Valley conditions, the best time to apply "Karmex" W is early spring. "Material that is applied in the fall will be subjected to leaching during the winter months," the bulletin says. "As a result of the leaching process, little or no chemical will be present in the root zone when the weeds start their growth in the spring. Ditch banks treated in March or April should be retreated in August."

Since "Karmex" W herbicide works through the root sys-



Measure width of ditch as indicated by the arrows.

tems of plants, best results are reported when the material is applied to a recently cleaned ditch. If applied to tall grasses, most of the chemical falls on the leaves, rather than reaching the ground, and spotty control results.

It is particularly important that the chemical be firmly anchored in the soil of the ditch bottom and sides before the ditch is used for irrigating. Otherwise, loose particles of the material may be washed out into the field, where it will kill crop plants with the same facility with which it annihilates the weeds. To accomplish this, the bulletin gives these specific directions:

"After the chemical has been applied to the banks, all portholes should be closed tightly. All precautions should be taken to be sure no water will run out into the field. Then fill the ditch to capacity, and let all this water soak in and dry up in the ditch. The water will move the chemical into the soil and down into the root zone and will not carry the chemical into the fields. After the ditch is completely dry, it is safe to use it for irrigating the crop. The effect of the chemical will not be noticed until about two weeks after application."

A rate of 40 pounds of "Karmex" W herbicide per acre is specified for weed control in ditches. The chemical is sold as a wettable powder and frequent agitation of the spray tank is required to keep the material in suspension in the water and assure its even distribution during the spraying operation.

At the 40-pound per acre rate, one pound of chemical will treat just under 1100 square feet of ditch surface. To determine the total area to be treated in a given ditch, multiply the length of the ditch by the width of the ditch -- measuring the width as illustrated in the drawing at right.

If trees grow sufficiently close to the ditches to have roots extending into or under the ditch, this chemical may also kill the trees and its use near valuable trees should be avoided. Or, as the California bulletin points out, "if the trees are not desired along the ditch, this may be a good way to get rid of them."

UREA ON PINEAPPLES

Spraying pineapple foliage with urea is an effective method of feeding nitrogen to pineapple plants, according to recent reports from Australian scientists. Secret of the success of this fertilizing operation, they say, is in the formation of the basal leaves which make a segment of a circle which holds some of the sprayed solution for gradual absorption.

SODIUM PROPIONATE CAN HELP PREVENT KETOSIS*

By Dr. L. H. Schultz
Associate Professor of Animal Husbandry
Cornell University

The economic losses to the dairyman resulting from ketosis are well known. There are several fairly satisfactory treatments. Probably the most common ones in this area are glucose injection, cortisone or ACTH injection, and the oral administration of sodium propionate. Although these treatments, either alone or in combination, are reasonably satisfactory, prevention of the condition would be more desirable provided it could be accomplished in a practical manner. This is particularly true in the case of herds where there is a high incidence of ketosis.

Numerous suggestions have been made for the prevention of ketosis, but lack of controlled experiments makes them difficult to evaluate. The feeding of molasses has long been suggested as an aid in ketosis prevention, but the experimental evidence available casts doubt on its value for this purpose. The use of rations high in protein has been suggested, but controlled experimental evidence is lacking.

It is felt that such things as not having cows excessively fat at calving time, bringing them up on feed fairly rapidly after calving, and the feeding of high quality roughage are helpful in preventing ketosis, but they are based primarily on field observations, which are difficult to evaluate.

Most of the treatments are not very well adapted to use for prevention. Sodium propionate, however, was one treatment which seemed to be fairly well adapted to use for prevention, since it was given orally. Other indications that it might be useful for prevention came from observations that: (1) the introduction of propionic acid into the rumen of normal animals caused marked increase in blood sugar, and (2) the level of propionic acid in the rumen was low at the time of ketosis.

Experimental

This report represents the results of an experiment designed to determine whether the feeding of sodium propionate for a period of six weeks after calving would prevent ketosis. The study covered a three-year period and involved 100 cows (50 pairs) in three different herds. Forty-four pairs of Holsteins, three pairs of Jerseys, and three pairs of Brown Swiss were used.

The cows within each herd were paired as equally as possible on the basis of previous production, history of ketosis, age, and time of calving. One member of the pair served as a control and the other, selected at random, was fed sodium propionate in the grain at a level of one-quarter of a pound daily for a period of six weeks after calving.

In the case of 12 pairs, the propionate was measured out in a plastic cup for each cow at each feeding and mixed into the grain by hand. For the remaining pairs, the propionate was pelleted into part of the grain mix so that the final level was two and one-half per cent of the special mix. This meant that a cow receiving five pounds of this feed night and morning (10 pounds daily) was consuming one-fourth pound of propionate daily. Any grain needed in addition was made up of the regular grain mix without propionate. Within each herd, all cows were fed the same type of roughage and grain mix and were handled normally. Grain was fed according to production.

Blood samples for sugar and ketone determinations were taken at one, three, five, and seven weeks after calving. The exact sampling date varied a maximum of two days from that scheduled to permit twice a week sampling. Additional samples were taken before and after treatment in the case of cows developing ketosis. Milk production was recorded on the day of sampling or, in one herd, on the day previous to sampling.

When difficulties unrelated to ketosis were encountered in one member of a pair, the pair was removed from the experiment. Metritis was the most common complication. Milk fever cases were left in since they all recovered satisfactorily following treatment. Palatability of the propionate feed was no great problem, although two pairs were removed because the experimental cows failed to eat the propionate feed well. Both of the cows had a history of being finicky eaters.

Ketosis was diagnosed only when all of the following requirements were fulfilled: (1) the cow was off feed, (2) production was down, (3) blood sugar was low and ketones were high. Ketosis cows were treated with propionate.

Results

The average values of blood sugar, blood ketones, and milk production at one, three, five, and seven weeks after calving for the 50 cows completing the experiment appear in Table I. One week after calving there were small differences in favor of the propionate-fed group, but only the differences in blood ketones were significant. At three weeks after calving the differences were most marked, all being highly significant in favor of the propionate-fed group.

At five weeks after calving the differences had decreased somewhat, but were still quite marked. Part of the recovery of the control group probably was due to the fact that most of the ketosis cases had been treated and had recovered by five weeks after calving. At seven weeks after calving, one week after propionate feeding had been discontinued, there were no significant differences.

The fact that the differences were small at the start, then became greater, and finally disappeared after propionate

feeding was discontinued suggests that the differences were due to the propionate feeding rather than other factors.

Table II shows the effect of the propionate feeding on the incidence of ketosis. There were nine cases of ketosis treated in the control group (eight Holsteins and one Brown Swiss), while the level of propionate was increased to three-eighths of a pound daily on two cows in the propionate-fed group. This was done because the blood picture on these two cows was abnormal, although they did not meet the other requirements for a ketosis diagnosis. Both cows returned to normal in blood picture at the next sampling after the propionate was increased.

Table II also shows that feeding of propionate prevented the blood sugar from falling to as low levels and the ketones from going to as high levels as the control group. It is interesting to note that about 40 per cent of the control cows showed at least a somewhat abnormal blood picture (below 40 mg. per cent sugar, above 20 mg. per cent ketones) some time during the first six weeks after calving. About half of these were not treated because other symptoms were not serious enough. No doubt production was reduced in these cows, however.

All of the ketosis cases occurred between one and five weeks after calving. By seven weeks after calving the blood picture was essentially normal in all cows, except that the ketones were still somewhat high. This indicates that the critical ketosis period is the first six weeks after calving. Several of the high-producing cows in the experimental group showed a drop in milk production when the propionate was discontinued, but none developed ketosis.

Discussion

Under the conditions of this experiment, it was possible to maintain lower blood ketones, higher blood sugar, and higher milk production, as well as reduce the incidence of ketosis, by feeding sodium propionate. However, the fact that some of the propionate-fed cows showed a somewhat abnormal blood picture indicates that one-fourth of a pound of propionate daily will not maintain a normal blood picture on all cows.

Even at increased levels it is doubtful that it will prevent ketosis in all cows because of the complicated nature of the condition. Certainly we should recognize the limitations under field conditions, where numerous complications are often involved.

In this experiment, ketosis was controlled in both groups of cows. In one group it was by a prevention schedule, in the other by treatment of the cases as they developed. Of course, less propionate was used for the treatment schedule because only

TABLE I: The effect of feeding one-fourth pound of sodium propionate daily for six weeks after calving on blood sugar, blood ketones, and milk production (50 pairs of cows.)*

Time After Calving	Control	Propionate-fed	Difference
1 Week			
Blood sugar	44.5	46.9	2.4
Blood ketones	11.0	8.9	2.1**
Milk production	51.2	54.4	3.2
3 Weeks			
Blood sugar	42.8	48.0	5.2***
Blood ketones	15.7	9.9	5.8***
Milk production	55.7	62.0	6.3***
5 Weeks			
Blood sugar	46.4	50.0	3.6***
Blood ketones	13.8	10.4	3.4**
Milk production	58.3	62.9	4.6***
7 Weeks (after propionate discontinued)			
Blood sugar	50.2	50.2	0
Blood ketones	10.5	8.5	2.0
Milk production	59.1	60.0	0.9

* Values represent averages for the 50 cows in each group. Blood sugar and ketones are expressed in mg. per 100 ml. and milk production in pounds per day.

** Differences significant.

*** Differences highly significant.

TABLE II: Effect of feeding one-fourth pound of sodium propionate daily for six weeks after calving on the incidence of ketosis (50 pairs of cows).

	Control	Propionate-fed
No. cases ketosis treated	9	Level increased for 2 cows
No. cows dropping below following blood sugar levels:		
40 mg. per 100 ml.	23	7
35 mg. per 100 ml.	14	2
30 mg. per 100 ml.	7	1
No. cows increasing above following blood ketone levels:		
20 mg. per 100 ml.	18	8
25 mg. per 100 ml.	12	1
30 mg. per 100 ml.	7	0
Mean minimum blood sugar (mg. per 100 ml.)*	39.1	43.4
Mean maximum blood ketones (mg. per 100 ml.)*	19.1	12.8

*Differences highly significant.

18 per cent of the cows were treated and the amount used per cow was somewhat less.

However, the propionate-fed cows produced just under 200 pounds of milk per cow more during the six-week feeding period, which more than paid for the cost of the propionate. This increased production appeared to be due to the fact that they were able to maintain a more normal production rather than any stimulation above normal.

Under field conditions, whether or not the preventive schedule would be practical would depend upon several factors, such as the incidence of ketosis, the level of production, the price of milk, and the cost of propionate. It appears that this material would have its greatest value in high producing herds with a high incidence of ketosis. Certainly there would be no advantage in feeding it to low producing cows not apt to have ketosis.

Feeds containing propionate appear to have three possible uses: (1) as a treatment for mild cases of ketosis while the cow is still eating, (2) as a follow-up of other treatments to prevent relapses, and (3) as a preventive. It seems that herds with a high incidence of ketosis could advantageously use special mixes containing propionate in any of the above ways. However, it is felt that these special mixes should be considered a specialized service feature for problem herds, to be used in cooperation with the veterinarian, and not something to be used by all dairymen.

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* This article is reprinted in abbreviated form from a recent issue of "Eastern Feed Merchant," through the courtesy of that publication.

In an article on internal parasites of poultry in "Poultry Comment," Dr. Riedel pointed out that immature stages of the cecal worm may cause epithelial damage and hemorrhage of cecal pouches of fowl. Cecal worm eggs also harbor and protect the organism causing blackhead. Relative to treatment, Dr. Riedel said:

* "The drug of choice for the treatment of cecal
* worms is phenothiazine administered in a gelatin capsule at
* the rate of 0.5 gram per animal. For group treatment pheno-
* thiazine is mixed at the rate of 151 grams per 44 pounds of
* feed. The feed is given for three-day periods at three-week
* intervals.

CHEMICALS BOOST EFFICIENCY IN COTTON PRODUCTION

by W. S. Jackson, Jr.*

Chemicals are well on the way toward eliminating one of the basic economic problems in the production of cotton -- the need for a large labor supply for the short hoeing season each year. Mechanized planters and pickers have already cut labor requirements for planting and harvest, and mechanical cultivation takes care of weed control after the cotton gets a good start.

There are two reasons for hoeing -- one is to thin out an over-planted stand. The other is to keep the rows free of weeds until the cotton plant is big enough to cast its own weed-protective shadow.

Modern planting procedures and chemical treatment of seed have done a great deal to achieve a good stand of healthy cotton without the need for over-planting and subsequent thinning or chopping. And now, there is every indication that hoeing for weed control can be eliminated by pre-emergence application of new chemical weed killers such as "Karmex" DL herbicide.

Good stands from the first planting can be virtually assured by using good quality seed which has been properly treated with "Ceresan" seed disinfectant. Plantings of acid-delinted cotton seed have shown a 48 per cent increase in stand when seed was properly treated with "Ceresan" M seed disinfectant. With fuzzy and machine-delinted seed, stands have been increased 23 per cent or more. Since the treatment costs only about 10 cents per acre, it is obviously cheaper and more efficient to plant treated seed than to buy extra seed and over-plant.

Treatment protects the seed in the soil from disease and decay organisms which might destroy it or deplete the storehouse of food which Nature provides to help get the seedling started. It also helps to control such diseases as seedling blight, anthracnose, or pink boll disease, and bacterial blight or angular leaf spot, which injure the growing plant or spoil the crop.

In addition to "Ceresan" M seed disinfectant, which is the familiar dust treatment commonly used by farmers, there is a dust-free formulation for use in slurry treaters, "Ceresan" M-2X. For those who want a liquid material that colors the seed conspicuously, a comparatively new material has been approved for use on cotton. It is called Liquid 364 seed disinfectant, and is made up of two mercury compounds -- one volatile, the other non-volatile. This combination fumigates and gives lasting protection.

Pre-emergence weed control with chemicals has substantially reduced the cost of hoeing in many fields. In some

cases, hoeing has been entirely eliminated or replaced with a single thinning operation.

Cotton acreage treated with "Karmex" DL herbicide totalled over 9,000 acres in 1954. About 75 per cent of this acreage was in the Mid-South where spray equipment is more commonly available than in other cotton areas. The typical Mid-South grower who used "Karmex" treated 35 to 40 acres. Some growers treated over 100 acres with good results. The material was used on a commercial basis in the Piedmont areas of the Carolinas, Georgia, and Alabama, and on the Delta areas of Mississippi, Arkansas and Louisiana.

It was difficult for many growers to evaluate pre-emergence weed control in 1954 because freezing temperatures required that two or three times the normal amount of acreage be replanted. Replanting disturbed the treated soil, reducing the effectiveness of pre-emergence weed control.

Otherwise, growers reported generally good control of the seedlings of such weeds as crabgrass, pigweed, purslane, cocklebur, lambsquarters, and water grass, at appreciable savings over hand-hoeing. Control lasted from three to eight weeks.

Plantation operators report normal hoeing costs ranging from \$5 to \$40 per acre per season. With "Karmex" DL herbicide used in pre-emergence weed control, at least one hoeing can be eliminated, and in some cases, as many as four hoeings have been eliminated. The cost for doing the job with "Karmex" DL is about \$2.50 or less for the chemical per acre of cotton.

In addition to its relatively low use cost, "Karmex" DL has other advantages. It is low in toxic hazard to people and animals under conditions recommended for use. It is non-flammable, non-corrosive, and non-volatile. The semi-liquid suspension handles easily. Being relatively insoluble, it resists leaching, giving weed control over an extended period.

"Karmex" DL herbicide, when used as directed, does not remain in the soil long enough to interfere with subsequent crops. A dozen or more plantations planted cover crops after trial applications in 1953 and no damage was reported. Winter cover on these fields included vetch, white clover, sweet clover, crimson clover, barley, rye, as well as volunteer seedlings of various grass and weeds.

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*Mr. Jackson, technical representative for the Du Pont Company, wrote this article at the request of "The Cotton Trade Journal." It is reprinted here with their permission.

WORM PARASITES OF CATTLE MAY BE STEALING STOCKMEN'S PROFITS IN NORTHERN STATES, WISCONSIN BULLETIN SAYS

Stock raisers in the northern tier of states, who assume they have no problems with stomach worms or other internal parasites infesting their herds, may be deluding themselves to the tune of a sizable cash loss, according to a bulletin just issued by the Department of Veterinary Science at the University of Wisconsin.

Statements in this bulletin -- "Control of Roundworm Parasites in Wisconsin Cattle" -- are based to a large extent on observations made during the past several years by Dr. A. C. Todd, parasitologist, who has been studying the parasite load carried by animals in typical Wisconsin herds, and the effect of that parasitism on the value of animal products produced by Wisconsin stockmen. His work has encompassed both dairy and beef herds.

"More than 20 different kinds of worm parasites infect our Wisconsin cattle," the bulletin declares. "None of our cattle escape these infections which constitute barriers to efficient production.

"Universal parasitic infection is acknowledged to be possible but, unfortunately, much of it has been considered to be of slight importance. It is true that worm parasites seldom cause numerous deaths in Wisconsin herds, although levels of fatal infections can occur. It is also true that non-fatal parasitic infections cause significant economic loss.

"It is generally believed that the winter temperatures in Wisconsin are so low that worm infections are prevented from reaching severe levels in any season. In actual fact, however, Wisconsin winter temperatures favor the perpetuation of parasitic infections which flourish whenever and wherever animals are crowded together in a restricted space. Wisconsin cattle are apt to be greatly crowded during the winter months when the animals are restricted to barns and feed lots.

"Each dairy and beef producer can obtain more efficient production by preventing and treating the worm infections in his herds."

While cattle which are lightly parasitized do not show symptoms which alarm their owners, the observing stockman can diagnose parasitic infections in his herd, once he knows what to look for, the bulletin points out.

"Look for the one or two animals which fail to do well in comparison with the rest," it advises. "Loss of weight or failure to gain weight properly, a rough coat, pale mucous membranes, either light to severe diarrhea or constipation, and loss

of appetite, or depraved appetite, all are signs which should cause the farmer to suspect parasitic infection.

"Diagnosis of parasitic infection begins with observation of the above signs of infection. The farmers' own observations should be supplemented by an examination by his veterinarian.

"A final diagnosis can be made by finding worm eggs in the manure and by recovery and identification of worm parasites at post-mortem examination."

Relative to treatment, the bulletin declares:

"Wisconsin dairy and beef producers have available to them a powerful weapon for the treatment of most worm parasite infections in their herds. One drug, phenothiazine, is effective against most of the worm parasites of cattle. . . In therapeutic doses, phenothiazine removes the majority of adult roundworms present in the animal, but such treatment does not prevent re-infections. In 'prophylactic' (preventive) doses, a continuous low-level feeding program, phenothiazine reduces egg production by female worms and inhibits the development of infective larvae in manure."

The most effective program of parasite control combines both types of treatment, the bulletin explains:

"Systematic roundworm control combines periodic treatment. . . with the feeding of a daily two-gram dose of phenothiazine to all calves, yearlings, bred heifers and bulls. The system has been found superior to periodic treatment alone."

Discussing the periodic treatment phase of this program it is recommended that "all young stock up to and including bred heifers be given full therapeutic treatment with phenothiazine immediately before the animals are put on pasture in the spring. This treatment should be followed by another full therapeutic treatment by the middle of June. The treatment should be repeated in the middle of August and again in the fall, just before the animals are housed for the winter."

The full therapeutic dosage of phenothiazine for mature cattle is two ounces -- for a calf, one ounce. When animals are in noticeably poor condition, the dose should be reduced. Such treatments are best performed under direction of a veterinarian, it is stressed.

The "prophylactic" treatment with daily two-gram dosages of phenothiazine in the feed is most effective when each animal has been given a full therapeutic treatment before the routine feeding begins. As the low-level feeding is then started, the amount of the drug in the feed should be brought up to the two-gram level gradually, so the animals become accustomed to the

taste of phenothiazine and do not refuse their feed. Various molasses preparations may also be added to the feed to overcome the palatability problem.

A system for administering daily two-gram dosages to milking cows has not yet been devised, the bulletin points out, since a substance derived from phenothiazine is secreted in minute amounts into the milk and more research is needed to determine whether this derivative is harmful to humans. It is known that a phenothiazine derivative in the milk of goats, sheep, mares, and cows is in no way toxic to their nursing offspring.

Even a light infection of internal parasites in either dairy or beef cattle may result in animals which do not grow properly and never reach their highest potential production of either milk or beef. In addition, lightly infected animals are dangerous to have around because they shed a sufficient number of worm eggs to cause severe infections in other animals on the farm.

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HOW TO SELL MORE EGGS!

* Let the customer take a look at the eggs in the
* carton and they'll sell themselves. At least that's the
impression gained in recent marketing tests.

Eggs in cartons with cellophane windows outsold eggs in ordinary cardboard containers by up to 40 per cent. For the experiments, the "look-in" packages were designed with 25, 40, and 50 per cent of the cover consisting of cellophane. Each was printed with an identical brand name, color, size and grade of egg and all were displayed in supermarkets along with conventional egg cartons. Relative positions in the display were changed at regular intervals to avoid any effect this might have on sales.

* The greater the window surface, the more sales
* resulted. Even the package with the least window surface,
* however, outsold the completely closed packages by 19 per
* cent.

EXPERIMENTERS' NOTATIONS

A Round-up of Data from Across the Nation

As a control for blue mold on spinach, "Manzate" fungicide is now being recommended in California and Texas and is chalking up some impressive records. In two recent tests in Eagle Pass, Texas, a dust containing eight per cent "Manzate" and five per cent DDT in talc was used. Airplane applications at 32 pounds per acre were made. The average results for both tests showed the yield of marketable spinach was increased by 67.8 per cent in plots dusted with "Manzate," compared with an increase of 57.3 per cent in plots dusted with a zineb fungicide. The plots where "Manzate" was used outyielded the untreated plots by 241 crates (20 pounds per crate) and topped the zineb plots by 38 crates. Even at a per acre cost of from \$20 to \$30, the use of "Manzate" increased the grower's net profit by \$200 per acre.

First recommendation for the use of a substituted urea weed killer to control a species of brush comes from Alabama, where the state experiment station says "Karmex" W herbicide at the rate of two-thirds of a cup per 100 square feet should be used to kill Cherokee Rose. This pest is a problem in many sections of the South. In Alabama alone it is estimated that enough land is covered by Cherokee Rose in nine counties to produce a million and a half pounds of beef annually if it were in productive pasture.

In Michigan, "Fermate" ferbam fungicide rated tops among the materials tested last year for the control of anthracnose on raspberries.

In cases where highly toxic residues must be avoided on crops, methoxychlor is recommended as a spray to control grasshoppers, according to a new USDA bulletin. The recommendation: "Spray with methoxychlor if you plan to pasture or feed dairy animals or animals being finished for slaughter on treated vegetation. Methoxychlor gives slower and lower kills than some other insecticides but prevents any serious grasshopper damage, and leaves no harmful residue. Prepare a wettable powder spray and apply it at the rate of three pounds of methoxychlor to the acre. If you neglect early control you will probably have to spray the fruit trees or vegetables." This would mean the application of six pounds of a 50 per cent wettable powder formulation, such as "Marlate" 50 methoxychlor insecticide.



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